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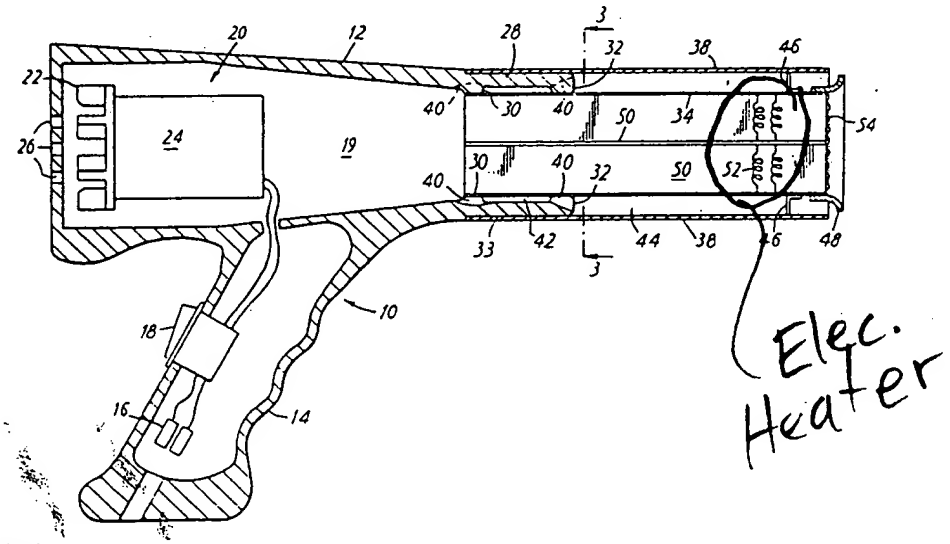

(57) Abstract

A hot air blower has a relatively thin heat insulating nozzle (34) mounted coaxially within a metallic shield (38). A blower (20) directs a flow of air to the nozzle where it is heated by an electrical heater (52). A portion of the flow from the blower is directed through channels (42) to pass between the nozzle and the shield to keep the shield relatively cool. The blower is suitable in one example for paint stripping.

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HEATED GAS BLOWER DEVICE

This invention relates to heated gas blower devices and in one example to hand-held devices suitable for tasks such as paint stripping.

Hot air guns have been produced with an electrically powered blower and an electrical heating element. Such guns have been suggested for use in paint stripping and are indeed effective. A problem that is encountered, however, is that because of the high air temperatures that need to be achieved for correct functioning of the gun, the nozzle - usually of metal to give the required mechanical strength - becomes hot enough to cause serious burns if touched accidently by the operator either during or immediately after use.

It is one object of this invention to provide an improved device in which the risk of injury to the operator is considerably reduced.

Accordingly, the present invention consists in a heated gas blower device comprising a nozzle; blower means for establishing a flow of gas through the nozzle; a heater for heating the flow of gas; a shield at least partially surrounding the nozzle; and means for directing a subsidiary flow of relatively cool gas from the blower means outwardly of the device between the nozzle and the shield to effect cooling of the shield.

Advantageously, said means for directing a subsidiary flow comprises a flow divider disposed between the blower means and the heater.

Preferably, the shield completely surrounds the nozzle.

Suitably, the shield and the nozzle comprise respective coaxial cylinders having substantially aligned free ends.

Advantageously, the shield is formed of metal and the nozzle of heat insulating material.

In one form of the invention, the free ends of the shield serves to support the free end of the nozzle.

The invention will now be described by way of example with reference to the accompanying drawing in which:-

Figure 1 is a sectional view, in partly diagrammatic form, of a device according to the invention,

Figure 2 is an end view of the device shown in Figure 1, and

Figure 3 is a section on line 3-3 of Figure 1.

There is shown in the drawing a hot air gun 10 comprising a body 12 moulded in two halves (suitably divided in the plane of Figure 1) from suitable plastics material. The body includes a hollow pistol grip 14 within which are located an electrical connector 16 for the connection of an external mains lead and a power on/off switch 18. In the main cavity 19 of the housing there is supported a blower shown schematically at 20, the blower being located by means of locating lugs (not shown) formed integrally with the body halves. The blower is of conventional form with a driven impeller 22 and an electric motor 24 supplied via the switch 18. Adjacent the impeller, the body is formed with air inlet apertures 26. Towards the right, as seen in the drawing, the body 12 tapers to an annular nose portion 28 which includes on its interior surface integral bearing rings 30 and 32. On its exterior surface, the nose portion 28 is formed with a stepped portion 33 which is of reduced diameter.

A cylindrical nozzle 34 of relatively thin heat-insulating material is located within the nose portion 28 and is held as a force fit against the two bearing rings 30 and 32. A cylindrical metal shield 38 which is coaxial with and of the same length as the nozzle 34 is mounted upon stepped portion 33. In this example, the nozzle 34 is formed of a mica-based material and the shield 38 of aluminium.

Each bearing ring is formed with a series of circumferentially spaced notches 40 (seen also in Figure 3) which serve to provide, with the annular gap between the rings, a series of channels 42 extending from the body cavity 19 to the annular gap 44 between the nozzle 34 and shield 38.

Towards its free end, the nozzle 34 has riveted to it a series of flanges 46 formed from light guage metal sheet. Each of these flanges engages the inner cylindrical surface of the shield 38 and thereby serves to support the relatively thin nozzle within the mechanically stronger shield. At the free end the nozzle carries - again suitably by riveting - a baffle ring 48.

Within the nozzle 34 there are located a pair of intersecting baffle plates 50 which lie in orthogonal diametric planes of the nozzle. These plates terminate short of the free end of the nozzle and, near that end, carry electrical heating elements shown schematically at 52. These elements are connected by leads (not shown) to the switch 18. Beyond the plates 50, the end of the nozzle 34 is covered by a protective wire grill 54.

The operation of the described device can now be understood.

The blower 20 will in use serve to establish a flow of air towards the nozzle 34 of, for example, approximately 500 litres/minute. Most of this flow will pass axially through the nozzle to be heated by the element 52 to a temperature of, typically, 600°C. Because of the notches 40, however, a small portion of the flow will be divided from the main flow and directed along the channels 42 and through annular gap 44 between the nozzle and the shield. This air of course by-passes the heating element and will be effective to cool the shield 38. At the free ends of the nozzle and shield, the relatively cool air will pass to the atmosphere, being directed away from the area to which heat is intended to be applied by means of the baffle ring 48.

It will be appreciated that because of the cooling air flow through annular gap 44, the shield is kept at a reduced temperature and, whilst still hot, will be less likely to cause injury. Because the nozzle is protected by the surrounding shield and supported at its free end through flanges 46, it does not need to be mechanically strong and can be made economically from relatively thin material. Since only a minor portion of the air flow is diverted for cooling purposes, the flow rate of heated air that can be achieved with a given blower is not significantly reduced.

It should be understood that this invention has been described by way of example only and numerous modifications are possible without departing from the scope of the invention. The shield and nozzle can take forms other than the described arrangement of coaxial circular cylinders and can be produced from materials other than those specifically mentioned. Further, the illustrated arrangement of notches cut into the body nose portion to divide the air flow could be replaced by other alternatives involving baffles or the like. Whilst, for simplicity, a heated air blower has been described, it is possible with suitable supply lines to produce jets of heated nitrogen or other gases with blower devices according to this invention.

CLAIMS

1. A heated gas blower device comprising a nozzle; blower means for establishing a flow of gas through the nozzle; a heater for heating the flow of gas; a shield at least partially surrounding the nozzle and means for directing a subsidiary flow of relatively cool gas from the blower means outwardly of the device between the nozzle and the shield to effect cooling of the shield.

2. A device according to Claim 1, wherein said means for directing a subsidiary flow comprises a flow divider disposed between the blower means and the heater.

3. A device according to Claim 1, wherein the shield completely surrounds the nozzle.

4. A device according to Claim 3, wherein the shield and the nozzle comprise respective coaxial cylinders.

5. A device according to Claim 4, further comprising a body with an annular mounting portion, the inward end of the nozzle being received within the mounting portion and the mounting portion being received within the inward end of the shield.

6. A device according to Claim 5, wherein said flow divider comprises aperture means formed in said annular mounting portion.

7. A device according to Claim 6, wherein said aperture means comprises a series of circumferentially spaced channels each extending axially through the mounting portion.

8. A device according to Claim 4, wherein the free ends of the nozzle is supported from the free end of the shield.

9. A device according to Claim 8, wherein the shield is formed of metal and the nozzle of heat insulating material.

10. A device according to Claim 1, further comprising handle means enabling the device to be hand held.

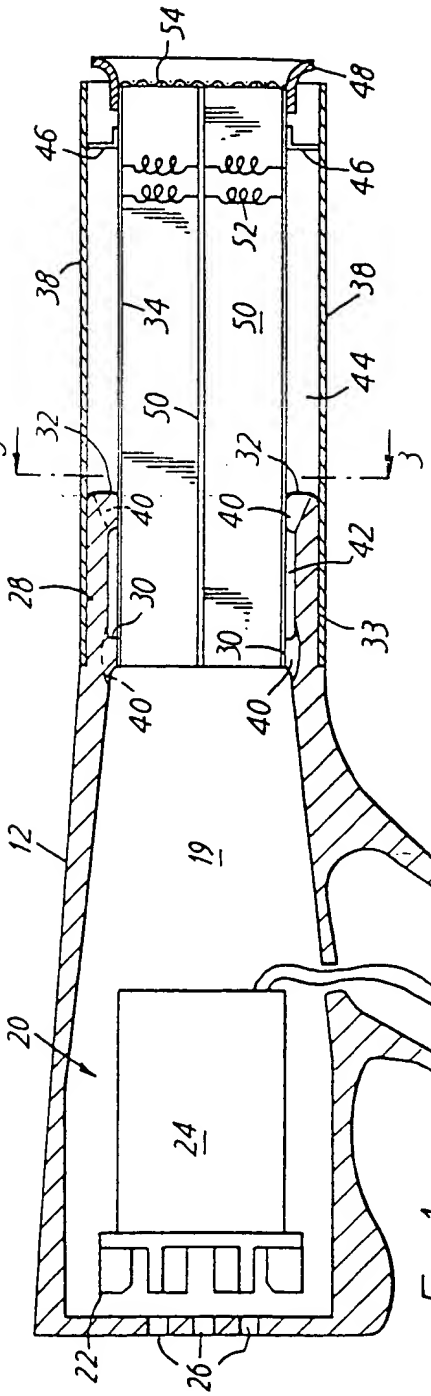

FIG. 1

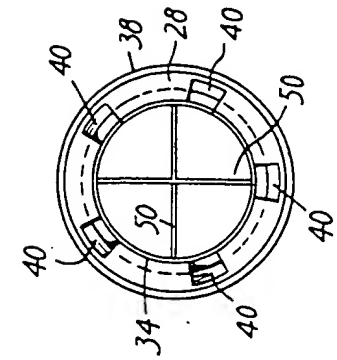

FIG. 3

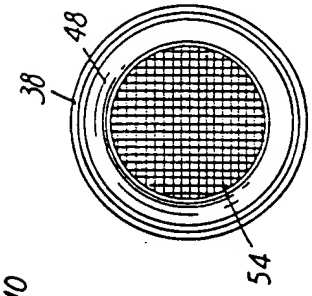

FIG. 2

INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 83/00042

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC[3]: B 44 D 3/16

II. FIELDS SEARCHED

Minimum Documentation Searched [4]	
Classification System	Classification Symbols
IPC[3]	B 44 D

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category [15]	Citation of Document, [16] with Indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
X	US, A, 3094606 (E.W. FERRIS) 18 June 1963 see column 1, line 56 - column 2, line 10; column 2, lines 37-46; figure 1	1-10

[15] Special categories of cited documents: [15]

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IV. CERTIFICATION

Date of the Actual Completion of the International Search [3]	Date of Mailing of this International Search Report [3]
24th May 1983	21 JUIN 1983
International Searching Authority [1]	Signature of Authorized Officer [20]
EUROPEAN PATENT OFFICE	G.L.M. Kruyenberg

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INTERNATIONAL APPLICATION NO. PCT/GB 83/00042 (SA 4769)

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 06/06/83

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 3094606		None	

For more details about this annex :
see Official Journal of the European Patent Office, No. 12/82